comparative value of the evidence somewhat differently. He has taken a very commendable degree of pains in collecting the opinions of former writers; though we have met with no notice of worthy old Derham, or the quick-eyed but fanciful Gruithuisen; but the natural result is the revival of a good deal of antiquated matter that can hardly claim a hearing before a modern tribunal; such as the assumptions of the Cosmotheoros (which by the way he invariably cites as "Cosmothereos") or the affected *niaiseries* of Fontenelle. In fact, excepting for those who would find interest or amusement in specimens of almost all that has been said upon the subject, however absurdly nonsensical, or needlessly pugnacious, the book would gain by a process of winnowing and compression and "weighting," if we may be permitted to use a technical expression. And there can be no question as to the advantage of a more careful revision of the press.

As regards the author's own share, there is much deserving of attention. He writes in an excellent spirit; in espousing the negative side of the question, there is no unfairness towards his opponents; and though some of his arguments carry little weight—for instance that drawn from what seems to him the "dismal," "horrible," "terrifying" aspect of the moon—others are well considered and expressed; and some collateral questions are handled in a way which demands attention, and will well repay it. With regard to the point in hand, if the present volume may not be thought to have done much to decide the controversy, it may be doubtful whether any future successor may do much more. The matter is in reality out of reach. The data are insufficient; and we venture to doubt whether any future generation may be able to attain more satisfactory ones. Long-continued and patient investigation may be fairly expected to throw some light upon the supposed final quiescence of the lunar surface; and possibly on the existence, under certain circumstances, of slight obscurations which might indicate the existence of a very attenuated atmospheric envelope; but this would still leave us at an immense and hopeless distance from any certain proof of habitation. As to the other heavenly bodies our position is worse still. The observations of Schiaparelli, supported to some extent by those of others, and at any rate deserving of respectful attention, tend to divest Mars of some of his supposed similarity to our own globe; and the conclusions hitherto attempted to be drawn as to the condition of the other planetary surfaces are, we venture to think, still less satisfactory. Opinion at present can be little better than conjecture; and it is uncertain at the best whether it will ever be permitted to us to make a further advance. The most ingenious analogical reasoning is not demonstration, and the decision of the finest telescopes would be invoked in vain. An interesting inquiry might be entered upon as to the prospects of opticians and observers; the conclusion possibly might be that their future is somewhat cloudy and obscure. At least we might venture to predict, from past experience, that the accomplished solution of any one of the mysteries which now confront us would only prove a prelude to problems still more insoluble, and proof still more convincing of the comparatively bounded character of all human knowledge.

OUR BOOK SHELF

United States Commission of Fish and Fisheries. Part vii. Report of the Commissioner for 1879.

THE contents of the present volume, embracing details of the work done by the United States Fishery Commissioner for the year 1879, are quite as varied and even of greater interest, if that be possible, than the preceding reports. The specific objects of the methodical inquiry which has now been going on for over twelve years, has for its object to report progress in regard to the propagation of food-fishes in the waters of the United States, as also to afford information as to the decrease in the stock of food-fishes. As has been already stated in the columns of NATURE, in which previous reports have been reviewed, the inquiry which has been so long in progress is being conducted in a thorough and searching way; it embraces the consideration of every topic calculated to throw light on the economy of the American fisheries. Nothing that can be deemed illustrative is neglected—the literature devoted to the natural history of food-fishes, or to descriptions of the fisheries of other countries, especially those of Europe, has been largely utilised in preparing the reports, with the result of making the volumes which have been issued a perfect encyclopædia of fishery information. The contents of the present report embrace a full account of the work overtaken in 1879 and the early part of 1880. The fishes which have been more particularly dealt with in the period noted are the Californian Salmon (*Salmo Quinnat*), the Atlantic Salmon (*S. Salar*), the Mountain or "Rainbow" Trout of California (*S. Irideus*), as also the Schoodic Salmon (*S. Salar*, var. *Sebago*). Various details are also given of what has been done in carp culture, as also of experiments made with the Striped Bass (*Roccus lineatus*), and the Shad (*Alosa sapidissima*). This fish is dealt with quite in wholesale fashion, the figures quoted being really marvellous, as many as 16,062,000 of young shad being distributed, a complete record being kept of the places to which they were forwarded; in the previous year the distribution of this fish reached the figure of fifteen and a half millions. Among the distinctive articles contributed to the present volume are some of rare importance; we may refer to that by Prof. Barlow on "The Marine Algæ of New England," which is both interesting and exhaustive; it extends to 210 pages of the volume now before us, and is illustrated by a series of well-executed drawings. Another paper of importance, full of curious information, is that of Mr. A. E. Verrill, "On the Cephalopods of the North-east Coast of America"; it is also profusely illustrated with fine drawings. "The Propagation of the Eel" is a contribution which is sure to attract attention; the article is by Dr. Otto Hermes, and was read before the German Fishery Association; although brief it contains many features of interest in connection with the natural history of the curious animal of which it treats, and describes most distinctly the differences of the two sexes. The author of this paper announces that the old eels, both males and females, die soon after the spawning season; "the extraordinarily rapid development of their organs of generation exhausts them to such a degree that they die soon after having spawned." This is the reason why they are never seen to return to the rivers. Among the miscellaneous contents of the present report will be found instructive essays on the food of marine animals, by Prof. E. Möbius. In the appendix will be found a very readable account of the herring fisheries of Iceland, as also a short treatise on the fisheries of the west coast of South America. One of the most scientific papers which is given is one containing a reprint of a series of extracts from the investigations of the Commission for the Scientific Examination of the German Seas—it contains much that will prove of interest both to naturalists and economists. It may be safely said alike of the

present and the preceding reports, that they contain a mass of information on fish and fisheries of a kind which has never been before brought to a focus, and in issuing such a guide to all interested, the United States Government has set us an example which we ought at once to follow. The volume is published at Washington, and is printed at the Government Printing Office.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts, No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Cyanogen in Small Induction Sparks in Free Air

AMONG the "Notes" in NATURE for July 19 (p. 281), where the products of combustion are given for various illuminants in common or uncommon use, and where coal-gas, oils, and candles have a fearful amount of both water-vapour and carbonic acid charged against them, the return for electric lights both in the arc and incandescent shapes is given as 0·0 for each; a return which is there considered to show "the great supremacy of electric lighting over all the other methods of illumination when considered as a matter of health."

Now this I believe is most happily true of the incandescent electric lights hermetically sealed in their vacuous glass globes; but who, on second thoughts, would presume to say that it is so with the arc lights, consuming their carbons visibly in the open air? The solid carbon gradually disappears from view, every one allows, and if it has not combined in gaseous condition with the oxygen of the atmosphere, like that of wax candles, it must have mainly combined with the nitrogen, and formed the far more deleterious compound gas, cyanogen, the basis of prussic acid: and that such gas or hydrocyanic acid is produced in the electric arc was set forth by Prof. James Dewar in the *Royal Society Proceedings* for June 19, 1879.

Leaving the great arc lights, therefore, to such a master of the subject, chemical, physical, and electrical, as the Jacksonian Professor in the University of Cambridge, I would request to be allowed to mention here a spectroscopic proof, which I have not seen mentioned before, that cyanogen is also formed in every induction electric spark worked under atmospheric pressure.

In plate 1 of M. Lecoq de Boisbaudran's admirable "Spectres Lumineux" he gives beautifully engraved views of the spectrum of the induction electric spark first at the positive pole, then at the negative pole with a "mean length" of spark, which was in his case probably about one inch; its extreme length with his induction coil and bichromate battery, in its best condition, being two inches.

Now the spectrum he gives for the positive pole is neither more nor less than the low temperature spectrum of nitrogen; that is as we see nitrogen in a gas-vacuum tube, with all its numerous and delicately shaded bands as such, though it is bioxide of nitrogen according to M. Thalén.

But the spectrum which M. Lecoq de Boisbaudran gives for the negative pole has in addition to the above, and besides the red hydrogen line, a number of other most distinct lines and bands, including one line in the violet, which he dignifies with the letter α, and which is certainly the grandest thing in the whole spectrum.

In his printed pages I do not find that the celebrated French spectroscopist gives any explanation of the origin of either that line or the other supernumeraries, the hydrogen line excepted. But on turning to my own paper on "Gaseous Spectra" printed in vol. xxx. of the *Transactions of the Royal Society, Edinburgh*, in 1881, I find on pp. 119 and 122, last column, that almost every one of the lines and bands which I had separated there from the impurities or dissociated elements of the tube's contents and had put down as due to the compound gas "cyanogen" is coincident in place and character with some one or other supernumerary in M. Lecoq de Boisbaudran's spectrum of the negative pole. My spectrum places are indeed very rough, owing to the small amount of dispersion then employed, viz. one simple prism of white flint with a refracting angle of 52°; but the testimony of the whole is cumulative, and, considering

Spark at the Negative Pole in the Open Air by M. Lecoq de Boisbaudran, with a rather Wide Slit

Colour Region.	W. N. Place approx. in Brit. inch.	Intensity approx.	Appearance approx.	Description.
Orange	41,300	2		Narrow band.
Citron	44,850	3		Stronger band with hazy line.
Green	48,600 49,300	4		Group of bands and hazy lines.
Green	50,100 50,800	3		Broad band with stronger edges.
Glaucous	53,800 54,700	4		Larger and stronger than the preceding.
Blue	55,200	2		Very thin line.
Violet	**59,400**	**8**		**Most powerful line, the α of the spectrum.**
Violet	59,500	5		A darkening of the nitrogen band.
Violet	59,900 60,400	5 5		Broad band, with strong terminal bars.

Cyanogen's Concluded Spectral Lines by C. Piazzi Smyth, with a rather Narrow Slit

Colour Region.	W. N. Place approx. in Brit. inch.	Intensity.	Appearance.	Description.	Reference page.
Orange	41,146 41,552	2 2		Cyanogen? Cyanogen	121
Citron	44,878	2		True cyan. group	120 & 121
Green	48,582	4		Sharp line begins a band of lines.	120
	49,350	3		Isolated line.	120 & 122
Green	49,996	2		Cyanogen.	120 and 122
	50,728	3		Do.	
Glaucous.	53,963	3		Not nitrogen nor carbon.	122
	54,570	2		Cyanogen?	
Blue	55,271	2		Cyanogen?	120
Violet	**59,405**	5		Grand line, followed by a band, characteristic of cyanogen.	120 & 122
Violet	59,985	2·0		Cyanogen.	120 & 122
	60,356	0·2		Cyanogen?	
Violet	60,541	1·0		Nitrogen?	

the totally independent manner in which my results were arrived at, and the certainty with which they were stated on their own merits, perfectly overwhelming.

Thus—of the line which I now identify with that one which is